REMARKS

A Request for Continued Examination (RCE) under 37 C.F.R. §1.114 and a Petition for an Extension of Time under 37 C.F.R. §1.136(a) are being filed concurrently herewith.

In the Office Action, claims 1-15, 18 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over International Application Publication No. WO 00/343369 (Nishihata '369).

By this Amendment, claims 1, 3-4 and 14 have been amended, and claims 2, 12-13, 18 and 21 have been canceled. Applicants believe that no new matter is introduced by any of the amendments, and support for the amendments may be found in the claims and specification as originally filed. Upon entry of this Amendment, claims 1, 3-11, 14-15 and 19-20 are pending, of which claims 19-20 are withdrawn. For the reasons set forth hereinbelow, Applicants traverse the rejections and respectfully request that the §103 rejections of the pending claims be withdrawn.

§103 Rejections

Claims 1, 3-11 and 14-15

Applicants have herein amended independent claim 1 and respectfully submit that claim 1, as amended, is nonobvious in view of Nishihata '369.

In accordance with the analysis stated in *Graham v. John Deere Co.*, a determination of obviousness under § 103 requires (1) determining the scope and content of the prior art; (2) ascertaining the differences between the claimed invention and the prior art; and (3) resolving the level of ordinary skill in the pertinent art. The question of obviousness must be resolved on the basis of these factual inquiries and any secondary considerations. *See* MPEP § 2141.

Applicants submit that the differences between the Nishihata '369 and the claimed invention are **substantial**, and that when the invention recited in claim 1 is considered as a whole, the invention recited in claim 1 is nonobvious in view of Nishihata '369. *See* MPEP § 2141.02 (stating that in determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious).

In the Office Action, the Examiner has determined that the resin composition disclosed by Nishihata '369 suggests the composition of the resin composition recited in claim 1, and that it would have been obvious to one of ordinary skill in the art to use the resin composition of Nishihata '369 to form or mold an article into a shape having a thickness not smaller than 4 mm.

Applicants respectfully disagree with these determinations. Not only is the resin composition recited in claim 1 different than that disclosed in Nishihata '369, the resin composition recited in claim 1 is produced by a process which is different from the process utilized to produce the resin composition disclosed in Nishihata '369.

Applicants note that amended claim 1 recites a stock shape for machining, where **(A)** the stock shape is a plate having a thickness of 4 to 70 mm or a round bar having a diameter of 4 to 70 mm, the plate or round bar is a solidified extruded product, **(B)** the solidified extruded product is a solidified extruded product of a resin composition and is produced by an extrusion and solidification method which includes the step of subjecting the solidified extruded product to a heat treatment for at least 30 minutes at a temperature of from 150°C to a temperature capable of retaining the solidified state (thereby removing residual stress), and **(C)** a length of burr observed is not longer than 30 μm.

Applicants also note that the Examiner has not identified any portion of Nishikawa '369 which discloses, teaches or suggests one or more of the above-described limitations recited in claim 1.

With respect to the plate thickness limitation recited in claim 1 (i.e., 4 to 70 mm), Applicants respectfully submit that the mere change in the thickness of the flat plate for measurement of surface resistivity as disclosed in Nishihata '369 from 3 mm to 4 mm or more fails to provide a dense and uniform flat plate from which residual stress has been removed. Nishihata '369 discloses that the resin composition is formed into a sheet or film by extrusion. However, when a sheet (plate) great in thickness is produced from the resin composition by general extrusion, it is difficult to produce a dense and uniform sheet free of voids. In addition, deformation of the sheet is liable to occur due to residual stress.

As explained in the present application, the stock shape for machining is required to have various properties, for example, (I) to be thick-wall and excellent in machinability, (II) to be low in residual stress, (III) not to be heated in excess by frictional heat generated upon machining to cause neither deformation nor discoloration, and (IV) to be able to be machined with high accuracy to scarcely produce burr upon, for example, drilling. However, it is extremely difficult to provide a thick-wall molded or formed product satisfying these various properties by general melt molding method such as injection molding or extrusion as disclosed in Nishihata '369. In addition, it is predicted that in the resin composition containing the carbon precursor and the conductive filler, these fillers fly off upon cutting or drilling or form the cause of production of burr.

Therefore, even an expert in this technical field has been skeptical about the fact that the resin composition disclosed in Nishihata '369 is used to obtain a stock shape for machining, which is great in thickness and suitable for machine working such as cutting and drilling. This is

apparent from the fact that any stock shape for machining formed from a resin composition containing a carbon precursor and carbon fiber was not proposed prior to filing of the present application.

With respect to the solidified extruded product limitation recited in claim 1, the solidified extruded product is obtained by extruding and solidifying the above-described resin composition through the following steps:

(1) a step of feeding the resin composition to an extrusion forming machine, to which a die assembly composed of an extrusion die and a forming die equipped with a cooling device at an exterior thereof and a passage in communication with a passage of the extrusion die at an interior thereof is coupled;

(2) a step of extruding the resin composition into a desired shape from the extrusion die while melting the resin composition by the extrusion forming machine; and

(3) a step of cooling an extruded product in a molten state extruded from the extrusion die in the interior of the forming die to solidify the extruded product.

It is important to note that the solidified extruded product is subjected to a heat treatment for at least 30 minutes at a temperature of from 150°C to a temperature capable of retaining the solidified state after the extrusion and solidification. The heat treatment is usually conducted by leaving the extruded product to stand in a heating oven.

Even in extrusion and solidification, to say nothing of ordinary extrusion, such a heat treatment under long-time and high-temperature conditions (heat treatment for at least 30 minutes at a temperature of at least 150°C) as described above is generally not conducted for continuously obtaining a long extruded product.

It is further important that the combination of the extrusion and solidification step and the heat treatment step as recited in claim 1 is not intended to simply limit the solidified extruded

product of the invention by these processes. The combination of the extrusion and solidification step and the heat treatment step indicates that **the residual stress** of the solidified extruded product has been removed by these processes. In other words, the extrusion and solidification step and the heat treatment step do not mean that the solidified extruded product is limited by the mere product-by-process, but indicate that the solidified extruded product obtained by these steps has such characteristics that the residual stress thereof has been removed.

A flat plate (sheet) great in thickness or a round bar can be produced even by ordinary extrusion. In the flat plate great in thickness or round bar, however, stress upon forming is liable to remain due to various causes such as a great difference in cooling speed between a surface portion and an interior.

According to the extrusion and solidification method, an extruded product in a molten state extruded from an extrusion die is cooling in the interior of a forming die to solidify the extruded product, so that a solidified extruded product that is little in voids, dense and uniform can be produced thought the product is a flat plate great in thickness or a round bar. However, even the solidified extruded product involves a problem that stress upon forming remains when the thickness thereof is great. If the residual stress of the solidified extruded product is great, it is liable to be deformed. In order to obtain a high-performance stock shape for machining excellent in dimensional stability, it is necessary to remove the residual stress.

The stock shape for machining recited in claim 1 is a solidified extruded product in the form of a plate having a thickness of 4 to 70 mm or a round bar having a diameter of 4 to 70 mm. This solidified extruded product is uniform and removed in residual stress though it is great in thickness or diameter. Therefore, the stock shape for machining recited in claim 1 is suitable for machine working such as cutting, drilling and shearing.

The fact that the stock shape for machining recited in claim 1 is extremely low in residual

stress is apparent from the fact that a burn-in socket body for FBGA package having satisfactory performance can be produced from a flat plate (width: 520 mm, thickness: 10 mm), from which residual stress has been removed by a heat treatment after extrusion and solidification, by shearing, cutting and drilling as shown in, for example, each Example.

The fact that the stock shape for machining recited in claim 1 is composed of a uniform solidified extruded product is apparent from the fact that the surface resistivity thereof can be accurately controlled to a predetermined value within a range of 10^5 to 10^{13} Ω/□, and the surface resistivity of a secondarily formed product obtained by machine working can also retain a value of the same level. In other words, the surface resistivity of the stock shape for machining according to the invention and the surface resistivity of the interior exposed by cutting or drilling are at the same level. This fact indicates that the stock shape for machining recited in claim 1 is dense and uniform. Table 1 of the present specification shows surface resistivity values (maximum surface resistivity and minimum surface resistivity values) of flat plates (solidified extruded products) and surface resistivity values (maximum surface resistivity and minimum surface resistivity values) of burn-in sockets obtained by subjecting the flat plates to shearing, cutting and drilling. It can be evaluated that these values are at the same level.

With respect to the length of burr observed limitation recited in claim 1, in the Examples disclosed in the present application show that the amount of burr produced upon drilling is ranked as A (shorter than 5μm) or B (not shorter than 5μm but not longer than 30 μm), and is therefore not longer than 30 μm. On the other hand, in a solidified extruded product containing conductive carbon black, the length of burr produced upon drilling exceeds 30 μm as shown in Comparative Example 4, and the amount of burr produced is great (Table 1). This fact indicates that the selection of carbon fiber as a conductive filler is advantageous.

Further support of the nonobviousness of the claimed invention is evidenced by the

following information. The stock shape for machining recited in claim 1 is produced and sold by Krefine Co., Ltd. Mr. Naomitsu Nishihata, who is a co-inventor of the invention recited in the present application, is a representative of Krefine Co., Ltd. Krefine Co., Ltd. is an associated company of Kureha Corporation who is an assignee of the invention recited in the present application.

Three sheets submitted herewith in Appendix A disclose information available by internet search. According to the information disclosed in these 3 sheets, it is apparent that manufacture and selling of the stock shape for machining recited in claim 1 has started on a world-wide scale including U.S.A. and China. The above information therefore demonstrates important aspects of the application of the technology to which the stock shape for machining is directed. The stock shape for machining recited in claim 1 is important in advancing the technology.

In addition, a photograph submitted herewith in Appendix B shows formed products obtained by subjecting the stock shape (plate) for machining recited in claim 1 to machine working such as cutting and drilling. As apparent from this photograph, the stock shape for machining recited in claim 1 can be accurately machined into optional forms, thereby providing various kinds of formed products high in dimensional accuracy.

Therefore, in view of the foregoing, Applicants submit that claim 1 is nonobvious in view of Nishihata '369. Applicants further submit that claims 3-11 and 14-15, which depend from claim 1, are also nonobvious in view of Nishihata '369. *See* MPEP §2143.03 (stating that if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious).

Accordingly, Applicants respectfully request that the §103 rejections associated with claims 1, 3-11 and 14-15 be withdrawn.

CONCLUSION

Applicants respectfully request a Notice of Allowance for the pending claims in this application. If the Examiner believes that personal communication will expedite the prosecution of this application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: April 5, 2010

Robert A. Muha

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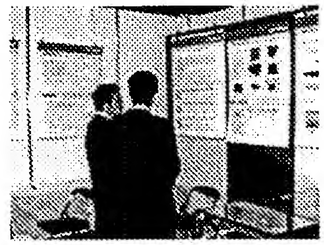
APPENDIX A

What's New

20-22 October

Exhibition of Reliability Center for Electronic Components of Japan



Krefine Co., Ltd had a booth to exhibit the Krefine® product line at the Industrial Plaza of Ohta-ku.

A presentation on ESD control material and Work shop for Krefine® were also held during this exhibition.

3 August

New product development, Krefine PEEK EKR-S130

Krefine Co., Ltd. has developed low dielectric constant PEEK materials, "EKR-S130". EKR-S130 has excellent dimensional stability and excellent precise machining properties. EKR-S130 is suitable for the material for high frequency IC test socket.

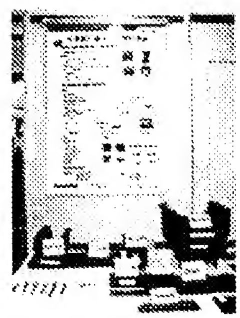
22-26 June

NPE 2009

Krefine Co., Ltd. had a booth to exhibit the Krefine® product line in NPE 2009 at Chicago, USA.

18-21 May

Chinaplas 2009



Krefine Co., Ltd. had a booth to exhibit the Krefine® product line in Chinaplas 2009 at Guanzhou, China.

17-19 March

Exhibition for SEMICON China 2009

Quatek Co., Ltd had a booth to exhibit the Krefine® product line in SEMICON China at Shanghai.

DISCLAIMER

Rods & Sheets

The surface resistance is easily controlled at the specific levels required for ESD control materials by use of Krefine's special carbon technology.
Krefine stock shapes provide consistent, repeatable surface and volume ESD values regardless of the thickness or measurement point on the stock shape.

Grade	EKH-SS07	EKH-SS09	EKH-SS10	EKH-SS11
Base Polymer	PEEK			
Surface Resistance	10^{6-8} ohms	10^{7-9} ohms	10^{9-10} ohms	10^{10-11} ohms
Typical Applications	Hard Disk Drive	Wafer Handling	Burn-in & Test Sockets	

Grade	EKR-S120	EKR-S130	ESH-SS07	ESH-SS11
Base Polymer	PEEK		PES	
Surface Resistance	10^{13} ohms	10^{12} ohms	10^{5-8} ohms	10^{10-11} ohms
Typical Applications	Test Sockets for High Frequency		Hard Disk Drive, Wafer Handling	Burn-in & Test Sockets

Grade	EIH-SSC	EIH-SS11	CDH-SS08	BIH-SS07
Base Polymer	PEI		PPS	PBI
Surface Resistance	10^{8} ohms	10^{10-11} ohms	10^{7-9} ohms10	$^{6-8}$ ohms
Typical Applications	Hard Disk Drive, Wafer Handling	Burn-in & Test Sockets	Hard Disk Drive, Wafer Handling	

Krefine Co., Ltd. will recommend the best polymer type to meet a customer's requirements when the specifics of the end use application are provided such as: ESD range, desired heat or chemical resistance, mechanical properties, etc.

 DISCLAIMER

Machined parts

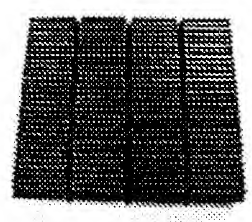
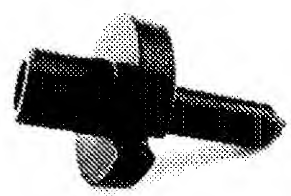
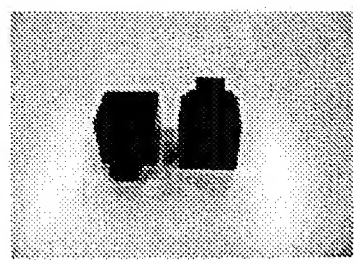
Krefine Co., Ltd. can also supply precision machined parts from our line of Krefine rods, sheets and injection molded near net shapes.

Polymer types available

PBI (Polybenzoimidazole)
PES (Polyethersulfone)
PPS (Polyphenylenesulfide)
PEEK (Polyetheretherketone)
PEI (Polyetherimide)
Other Polymers can be provided on request

Range of ESD Resistance (Surface & Volume)

Krefine SS11 series : $10^{10\text{-}12}$ ohm
Krefine SS09 series : $10^{8\text{-}10}$ ohm
Krefine SS07 series : $10^{6\text{-}8}$ ohm

Please contact our offices with your designs and requirements.

DISCLAIMER

APPENDIX B